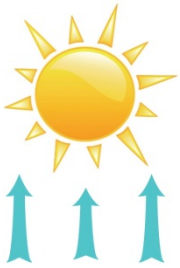
BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday July 22, 2016

Hot, dry weather dominated this week – great for haying. A few scattered thunderstorms dropped a little rain and a little hail on isolated areas. Weekly crop water use was high and reached its yearly peak for small grains at about 2 inches. Hot and dry weather is forecast for next week so crop water use will be similar. Remember that crop water use drops by about 2/3 the first week after cutting and by about 1/3 the second week. Drought conditions have arrived and drought management plans are being implemented – call Jennifer with questions. The last page of this report is a summary of recommendations for the entire irrigation season.

WEATHER – CONTINUED HOT AND DRY, ISOLATED THUNDER

Hot, dry weather dominated this last week and will continue. Scattered thunderstorms may bring isolated small amounts of rain or hail but no significant accumulations. The 30 and 90 forecasts continue to predict above normal temperatures. The 30 day forecast predicts below normal rainfall while the 90 day forecast says normal rainfall.

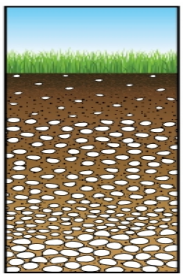


CROP WATER USE – CONTINUED HIGH NEXT WEEK

Crop water use will continue to be high next week as hot weather continues. Crop water use decreases with cutting by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third. Crop water use was above average throughout April, below average in May, bounced around average in June and stayed above average for most of July (chart page 3).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]	SEASON TOTAL[2]
HAY CROPS	**1.6**	**1.6** (1.4 - 1.8)	16.3
PASTURE	**1.4**	**1.4** (1.2 - 1.6)	14.6
SPRING GRAINS	**2.0**	**1.8** (1.7 - 1.9)	13.7
WINTER WHEAT	**0.1** (Harvested)	**0.1** (0.0 - 0.1)	13.0
LAWNS	**1.5**	**1.5** (1.4 - 1.7)	15.4

[1]Expected water use (range if weather becomes cooler or hotter than expected)
[2]Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but now include April

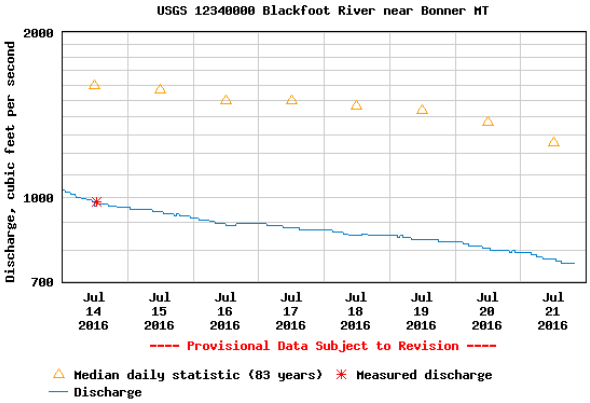


SOIL MOISTURE – LOWER FOR HAYING

Most folks are letting soil moisture fall, especially in the surface layer to help the newly cut hay dry. Those who have water will irrigate once after haying and then stop or much reduce irrigation. Hopefully you have some stored up because there is little left in the river.

WEEKLY TIPS

DROUGHT 2016



The Blackfoot River flow at Bonner has fallen steadily this week and is at about half of its average flow. Todays flow is near 750 cfs compared with an average of 1,400 cfs. The low flow for this date was 512 cfs in 1988 and the high was 4,780 cfs in 1899.

Governor Bullock added Powell County to the *Drought Alert* list this week. Low flows and predictions of hot dry weather in the 30 and 90 day weather forecasts suggest that drought conditions will worsen before improving.

DROUGHT PLANNING – NOW AND IN THE FUTURE

With each year now being the warmest on record, maybe we should start some serious planning for a future with lower water levels and higher crop water use. Some things you can do to prepare for drought conditions are:

- Pour the water on in May and June when its available;
- Fill up your soil to its' water holding capacity before critical stream flow periods;
- Improve soil health, especially organic matter content;
- Apply more water during each application so more goes into the soil;
- Save water for critical growth periods;
- Reduce irrigated acreage and irrigate that well;
- Concentrate your efforts on the first cutting and then relax;
- Plant crops that use less water on at least a portion of your acreage;
- Grow your crop during the cooler early season and reduce or stop irrigation during the highest crop water use period which coincides with the lowest stream flow period;

BLACKFOOT DROUGHT RESPONSE PLAN (as revised in April 2013).

Last week we listed the details of the Drought Response Plan. This week we summarize the main points. Please refer to the Committee for more details and expect updates in this weekly report.

The purpose of the Blackfoot Drought Response Plan is to minimize the adverse impacts of drought on fisheries and to aid in the equitable distribution of water resources during low flow summers. Some of the important features of the Blackfoot Drought Response Plan are:

- Shared Sacrifice – the idea that all water users share when water is scarce.
- Blackfoot Drought Committee – a diverse group of interested water users.
- Flow and Temperature Triggers – These levels trigger specific actions by water users, managers and interest groups. Triggers are at flows of 700, 600 and 500 CFS and at temperatures of 60, 65 and 71ºF.

For more information on the Drought Response Plan Contact Jennifer

For further information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

BLACKFOOT 2016 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

	RAIN[1]	2016 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/6/2016	0.20	0.80	0.70	0.25	0.25	0.90	0.70	0.50	0.80	0.20
5/13/2016	0.30	0.90	0.80	0.25	0.25	1.10	0.80	0.80	1.00	0.50
5/20/2016	0.01	1.00	0.90	0.50	0.25	1.10	1.00	1.00	1.10	0.70
5/27/2016	1.00	0.60	0.50	0.30	0.25	0.70	0.60	1.20	1.20	0.80
6/3/2016	0.20	1.00	0.90	0.70	0.40	1.10	1.00	1.30	1.30	0.90
6/10/2016	0.10	1.50	1.40	1.25	0.70	1.60	1.50	1.40	1.50	1.00
6/17/2016	0.20	1.25	1.20	1.30	0.70	1.40	1.20	1.50	1.70	1.10
6/24/2016	0.10	1.50	1.40	1.60	1.20	1.50	1.50	1.50	1.90	1.10
7/1/2016	0.01	1.70	1.50	1.80	1.80	1.10	1.60	1.50	2.00	1.20
7/8/2016	0.01	1.70	1.60	1.80	1.80	0.50	1.50	1.60	2.10	1.30
7/15/2016	1.25	1.20	1.00	1.30	1.30	0.10	1.20	1.60	2.00	1.20
7/22/2016	0.10	1.60	1.40	1.90	2.00	0.10	1.50	1.50	1.90	1.20
7/29/2016								1.50	2.20	1.10
8/5/2016								1.40	1.70	1.00
8/12/2016								1.20	1.50	0.90
8/19/2016								1.00	1.30	0.70
8/26/2016								0.80	1.00	0.50
9/2/2016								0.60	0.80	0.40
9/9/2016								0.60	0.70	0.30
9/16/2016								0.50	0.70	0.30
9/23/2016								0.40	0.60	0.20
9/30/2016								0.40	0.60	0.20
TOTAL	**4.18**	**16.25**	**14.55**	**13.70**	**11.65**	**12.95**	**15.35**	**24.80**	**31.10**	**17.30**

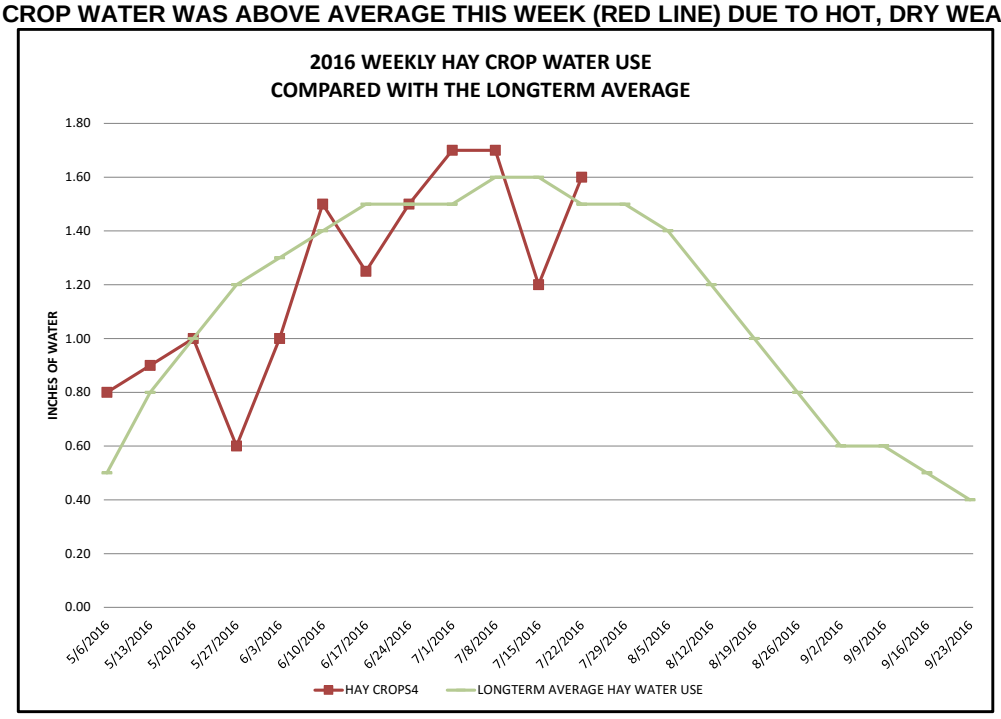
[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

[2] **This years** maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary slightly across the drainage.

[3] **Longterm average** water use for each crop each week based on long-term historic data.

[4] Hay Crop water use is reduced by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.

CROP WATER WAS ABOVE AVERAGE THIS WEEK (RED LINE) DUE TO HOT, DRY WEATHER



THE BLACKFOOT DRAINAGE IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations with more detail provided throughout our irrigation guide.

APRIL – GET READY AND PLAN YOUR IRRIGATION STRATEGY!

- Get your irrigation system ready – perform maintenance and test system.
- Evaluate soil moisture conditions and weather predictions then plan for irrigation and drought if needed.

MAY – CHECK SOIL MOISTURE & BE READY FOR UNUSUAL HEAT OR COLD!

- Check the soil moisture content at the start of growing season and fill up the soil to its water holding capacity during early irrigations (2-4 inches).
- Watch for dry soil conditions, especially with new plantings and apply water to ensure good germination and emergence.
- Irrigate deeply at least once early in the season to promote deep root growth.
- Apply 2-5 inches of irrigation to hay and pasture crops in May depending on weather. Apply 0-2 inches to spring grains and new plantings as needed based on weather and growth. Apply extra water to fill up the soil (2-4 in).

JUNE – THIS IS THE TIME TO MAKE YOUR BIGGEST EFFORT SO POUR IT ON!

- Apply 6-8 inches of irrigation in June to hay and pasture crops and winter wheat depending on weather. Apply 5-8 inches to spring grains and new plantings as needed based on weather and growth.
- Consider irrigating deeply to fill up soil root zone and promote deep root growth.
- Be sure small grains are irrigated well during their critical periods of boot, bloom and early heading.

JULY – POUR IT ON UNTIL HARVEST AND RETURN QUICKLY

- Apply 1 - 2 ½ inches of irrigation per week in July to all crops - depending on weather.
- Cutting is a critical stress period for hay crops, especially alfalfa so irrigate deeply to fill up the root zone before cutting then get back across the field quickly after cutting. Crop water use declines when hay is cut so this is a good opportunity to fill up the soil again. Irrigate at least once after cutting.
- Stop irrigating small grains at the milk to soft dough stage but be sure there are 1- 2 inches of soil moisture left at this stage to prevent kernels from shrinking.

AUGUST- KEEP IRRIGATING SMALL GRAINS UNTIL KERNELS MATURE, BE DROUGHT AWARE!

- Apply 1 - 2 inches of irrigation per week in August to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed.
- Many folks irrigate for pasture following their one hay cutting. Irrigate according to how much pasture you seek and with consideration for other water needs in the drainage, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time.

SEPTEMBER – APPLY AS NEEDED/AVAILABLE & GET READY FOR SPRING!

- Apply ½ - 1 ½ inches of irrigation per week in September to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed. Prepare the system for winter and an early start next spring.